

ADVERSE CHILDHOOD EXPERIENCES AMONG KANSAS ADULTS

2014 Kansas Behavioral Risk
Factor Surveillance System

Adverse Childhood Experiences Among Kansas Adults

2014 Kansas Behavioral Risk Factor Surveillance System

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**THE JUNIOR LEAGUE OF
WICHITA**



Kansas Children's Service League

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Executive Summary

Researchers have demonstrated a link between adverse childhood experiences (ACE) of abuse, neglect and family dysfunction and health status later in life. This may be explained in part by a toxic physiological stress response, such as elevated stress hormone levels, to multiple stressors, which may have damaging effects on a child's developing brain. The Behavioral Risk Factor Surveillance System (BRFSS) introduced an optional module in 2008 to assess the relationship between ACE and health status at the population-level. The ACE optional module was included for the first time in the Kansas BRFSS in 2014.

The ACE module is comprised of 11 questions that assess the following eight categories of ACE:

Childhood Abuse

1. physical abuse
2. sexual abuse
3. emotional abuse

Household Dysfunction

4. presence of a mentally ill household member
5. alcohol or drug abuse in the household
6. incarcerated household member
7. violence between adults in the household
8. parental divorce or separation

Self-reported exposure to any single adverse childhood experience category is counted as one point toward the final ACE score (range: 0 to 8). SAS complex survey procedures were used to calculate overall and subpopulation prevalence estimates of each adverse childhood experience category and ACE score. Prevalence estimates of various health risk factors, perceived poor health indicators and chronic conditions were also examined by ACE score. In addition, logistic regression was used to examine the association between ACE score category and various health risk factors and conditions, while controlling for selected demographic characteristics.

Key Findings:

- ACE are prevalent: slightly more than half of Kansas adults have experienced at least one adverse childhood experience.
- In Kansas, high ACE scores (3+) are more common among younger adults, those with lower levels of educational attainment, those with lower annual household incomes, non-Hispanic other and multiracial adults, Hispanics and women.
- The prevalence of current smoking, binge drinking, obesity, poor/fair general health, 14 or more days of poor physical health, 14 or more days of poor mental health, arthritis, current asthma, chronic obstructive pulmonary disease (COPD) and depression were higher among adults with high (3+) ACE scores compared with those with no ACE.

- Significant positive associations were observed between ACE score category and all selected health risk factors, perceived poor health indicators and chronic conditions, after controlling for demographic characteristics.

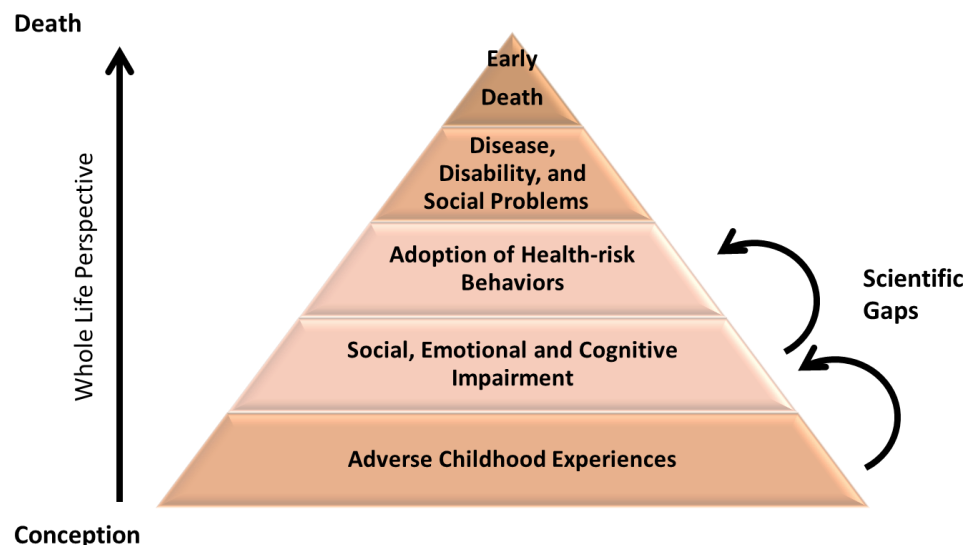
Kansas data mirror findings in other states and highlight the need to increase awareness of ACE as a public health issue. Preventing ACE may have beneficial effects on the long-term health of Kansans.

Introduction

The ACE Study

Researchers have demonstrated a link between adverse childhood experiences (ACEs) of abuse, neglect and family dysfunction, and health status later in life.ⁱ This may be explained in part by a toxic physiological stress response, such as elevated stress hormone levels, to multiple stressors, which may have damaging effects on a child's developing brain.^{ii,iii} The ACE study, a collaboration between the Centers for Disease Control and Prevention (CDC) and Kaiser Permanente's Health Appraisal Clinic in San Diego, CA, is one of the largest investigations ever conducted to assess associations between childhood maltreatment and health and well-being later in life.^{iv} The initial phase of the ACE study was conducted from 1995 to 1997. At the time the study was conceptualized, the relationship between single types of abuse, primarily sexual abuse, and poor outcomes across the lifespan were well known, but the impacts of a broad range of childhood abuse and household dysfunction had not yet been assessed (Figure 1).^v Based on this knowledge, the study sought to examine multiple types of abuse and trauma and their cumulative effects on health outcomes in adulthood. ACE study findings suggest that certain experiences are major risk factors for the leading causes of illness and death as well as poor quality of life in the U.S. Associations between ACE and health outcomes have since been examined using population-based surveys, including the Behavioral Risk Factor Surveillance System (BRFSS).

Figure 1. Conceptual Framework for the ACE Study



The Kansas Behavioral Risk Factor Surveillance System (BRFSS)

The BRFSS is an ongoing, population-based, random-digit-dialed telephone survey of non-institutionalized civilian adults 18 years and older. The survey is coordinated by the Centers for Disease Control and Prevention (CDC) and is conducted annually by all 50 states, the District of Columbia and several U.S. territories. The BRFSS introduced an optional module in 2008 to assess the relationship between ACE and health status at the population-level. The ACE optional module was included for the first time in the Kansas BRFSS in 2014.

The complex survey methodology and analytical procedures for BRFSS are designed to produce prevalence estimates that can be generalized to Kansas adults statewide. Prevalence estimates are estimates of a true value (population parameter) and are thus subject to random variation. Ninety-five percent confidence intervals are used to characterize this variability and can be thought of as a range of values that will contain the true value 95 percent of the time.

Several considerations should be taken into account when interpreting BRFSS estimates:

- BRFSS estimates do not apply to individuals without telephone service (approximately 2.9% of the population),^{vi} those who reside on military bases or within institutions or those who are unable to complete a telephone survey.
- BRFSS prevalence estimates are self-reported and are subject to bias due to respondents' inability or unwillingness to provide accurate information about their own behaviors or characteristics.
- Prevalence estimates are only reported when they are based on at least 50 denominator respondents and 5 numerator respondents.

A more detailed explanation of the survey methodology used for the Kansas BRFSS is available at <http://www.kdheks.gov/brfss/technotes.html>.

ACE Categories and ACE Scores

The BRFSS ACE module is comprised of 11 questions that assess the following eight categories of ACE:

Childhood Abuse

1. physical abuse
2. sexual abuse
3. emotional abuse

Household Dysfunction

4. presence of a mentally ill household member
5. alcohol or drug abuse in the household
6. incarcerated household member
7. violence between adults in the household
8. parental divorce or separation

All questions refer to the time period before respondents were 18 years old.

Self-reported exposure to any single ACE category is counted as one point toward the final ACE score (range: 0 to 8) (Table 1). ACE scores were only calculated for respondents who answered all 11 questions in the BRFSS ACE module (n=11,353). Responses of “don’t know” or “refused” were coded as missing for all questions.

Table 1. ACE categories and scoring: KS BRFSS ACE module survey questions and response options

ACE Category	Survey Question*	Response Options	Scoring
Childhood abuse			
Physical abuse	"How often did your parent or an adult in your home ever hit, beat, kick, or physically hurt you in any way? Do not include spanking."	Never/Once/More than once	1= Once or More than once 0=Never
Sexual abuse	"How often did anyone at least 5 years older than you or an adult..." "...ever touch you sexually?" "...try to make you touch them sexually?" "...force you to have sex?"	Never/Once/More than once	1= Once or More than once to one or more of the three questions included in this category 0=Never to all three questions in this category
Emotional abuse	"How often did a parent or adult in your home ever swear at you, insult you, or put you down?"	Never/Once/More than once	1= More than once 0= Once or never
Household dysfunction			
Mentally ill household member	"Did you live with anyone who was depressed, mentally ill or suicidal?"	Yes/No	1=Yes 0=No
Substance abuse in household	"Did you live with anyone who..." "...was a problem drinker or alcoholic?" "...used illegal street drugs or who abused prescription medications?"	Yes/No	1= Yes to one or more of the two questions included in this category 0=No to both questions in this category
Incarcerated household member	"Did you live with anyone who served time or was sentenced to serve time in a prison, jail or other correctional facility?"	Yes/No	1=Yes 0=No
Violence between adults in household	"How often did your parents or adults in your home ever slap, hit, kick, punch or beat each other up?"	Never/Once/More than once	1= Once or More than once 0=Never
Parental separation/divorce	"Were your parents separated or divorced?"	Yes/No	1=Yes 0=No

*All questions refer to the time period before respondents were 18 years old.

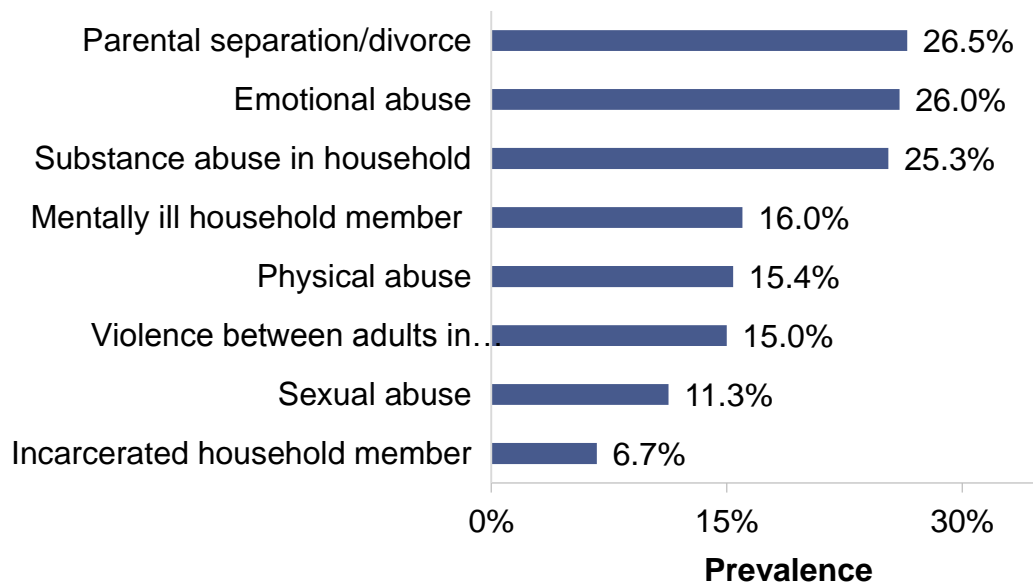
Note: Results disseminated prior to the current publication may differ slightly due to differences in categorizing emotional abuse. Some researchers have defined exposure to emotional abuse as a response of "Once" or "More than once" to the emotional abuse question indicated in the above table.^{vii} Here, we define exposure to emotional abuse as a response of "More than once" to the indicated question.^{viii}

Findings

Prevalence of Adverse Childhood Experiences

Parental separation/divorce, emotional abuse and substance abuse by a household member were the most common adverse childhood experience reported by Kansas adults in 2014 (Figure 2). Approximately 1 in 4 Kansas adults reported that their parents were separated or divorced (26.5%). Similar percentages of Kansas adults reported experiencing emotional abuse (26.0%) and substance abuse by a household member (25.3%).

Figure 2. Prevalence of Adverse Childhood Experiences (ACE) among Kansas adults aged 18 years and older by ACE category, KS BRFSS 2014



Source: 2014 Kansas Behavioral Risk Factor Surveillance System, Bureau of Health Promotion, KDHE.

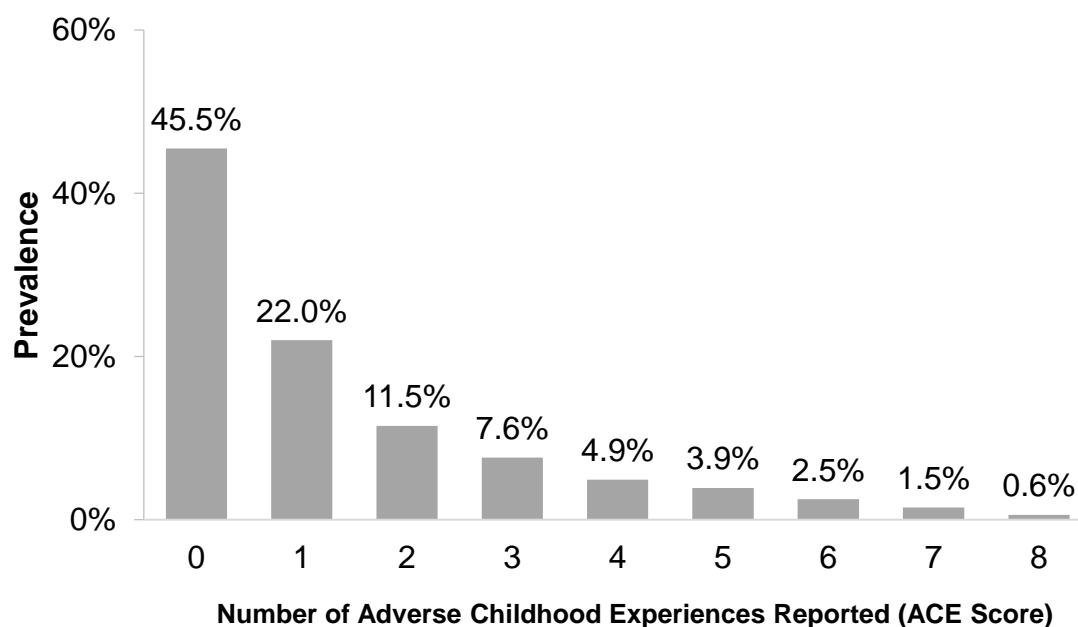
Slightly more than half (54.5%) of Kansas adults reported having experienced at least one ACE (Figure 3). More specifically, 1 in 3 Kansas adults had one or two ACE, and 1 in 5 had three or more ACE (Figure 4). The distribution of ACE scores among Kansas adults mirrors findings from other states.^{vi,vii}

In 2014, the percentage of Kansas adults who experienced three or more ACE was significantly **higher** among (Figure 5):

- Women compared with men;
- Adults younger than 65 years old compared with adults aged 65 years and older;
- Hispanics and non-Hispanic other/multiracial adults compared with non-Hispanic whites;
- Those with an annual household income of less than \$15,000 compared with adults in higher annual household income groups; and
- Those with less than college education compared with college graduates.

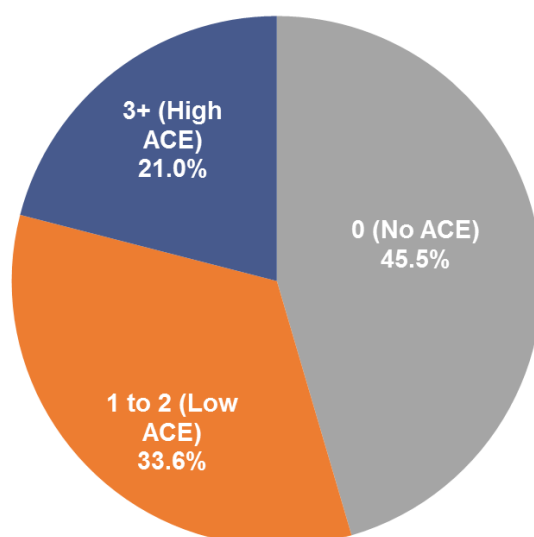
For additional information on the prevalence of Kansas adults who experienced zero, one to two and three or more ACE by demographic characteristics, see Appendix A.

Figure 3. Prevalence of Adverse Childhood Experiences (ACE) among Kansas adults aged 18 years and older by ACE score, KS BRFSS 2014



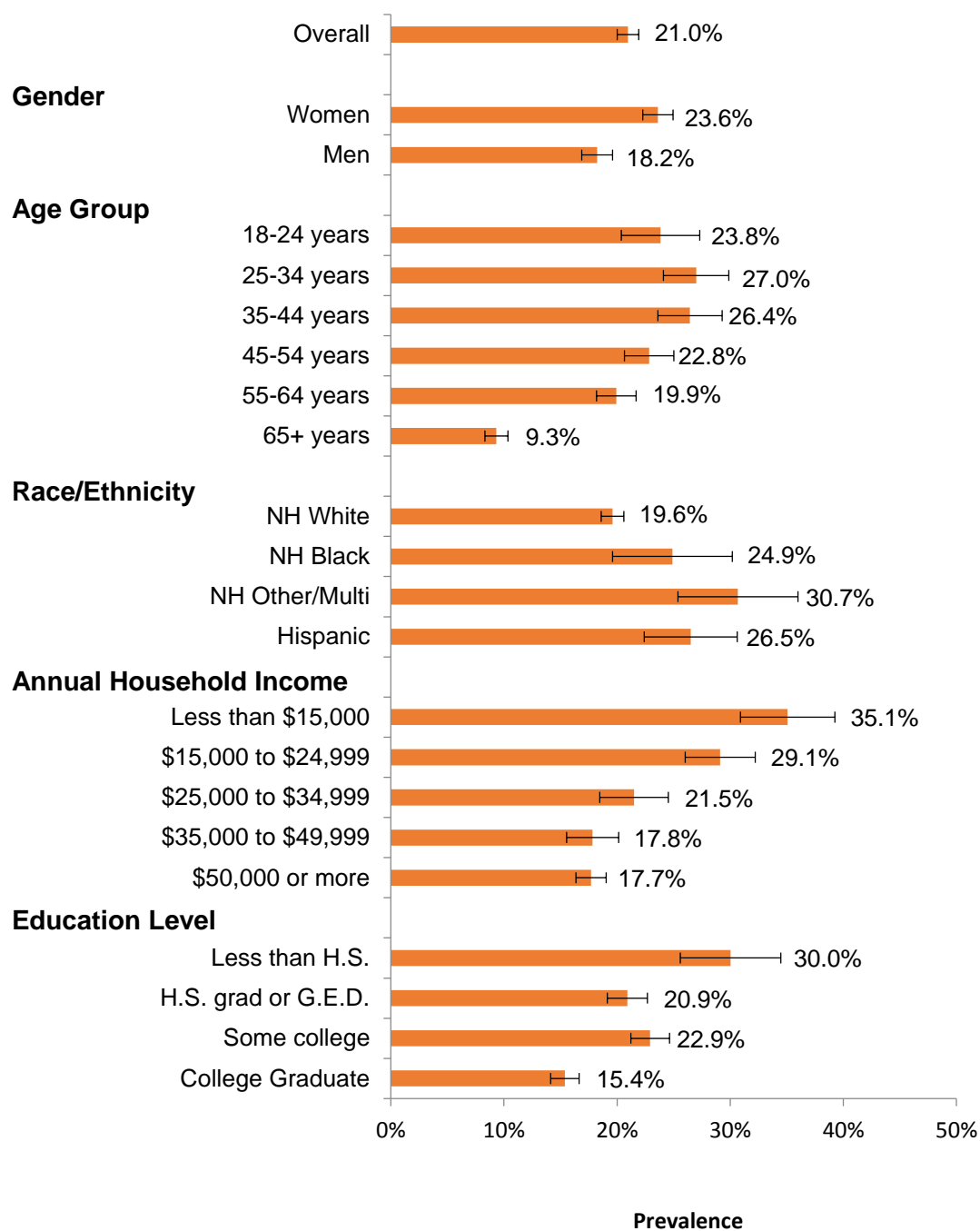
Source: 2014 Kansas Behavioral Risk Factor Surveillance System, Bureau of Health Promotion, KDHE.

Figure 4. Prevalence of no, low and high ACE among Kansas adults aged 18 years and older, KS BRFSS 2014



Source: 2014 Kansas Behavioral Risk Factor Surveillance System, Bureau of Health Promotion, KDHE.

Figure 5. Prevalence of high (3+) ACE among Kansas adults aged 18 years and older by selected demographic characteristics, KS BRFSS 2014



Source: 2014 Kansas Behavioral Risk Factor Surveillance System, Bureau of Health Promotion, KDHE.

Prevalence of Health Risk Factors and Health Conditions by ACE Score

Compared with those who did not experience any ACE, Kansas adults with high ACE scores (3+ ACE) had significantly higher prevalence of the following health risk factors (Figure 6):

- Current smoking,
- Binge drinking, and
- Obesity.

Similarly, Kansas adults with high ACE scores had significantly higher prevalence of the following perceived poor health indicators (Figure 7) and chronic conditions (Figure 8):

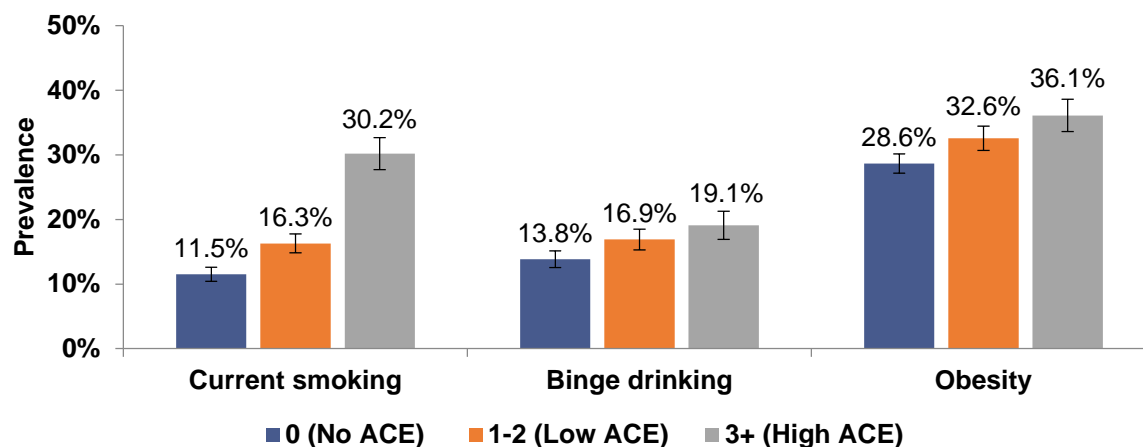
- Poor/fair general health,
- 14 or more days of poor physical health,
- 14 or more days of poor mental health,
- Arthritis,
- Asthma,
- COPD, and
- Depression.

However, no significant differences in prevalence were observed among ACE score subgroups for the following health conditions:

- Cancer,
- Coronary Heart Disease,
- Diabetes,
- Heart attack,
- Kidney disease, and
- Stroke.

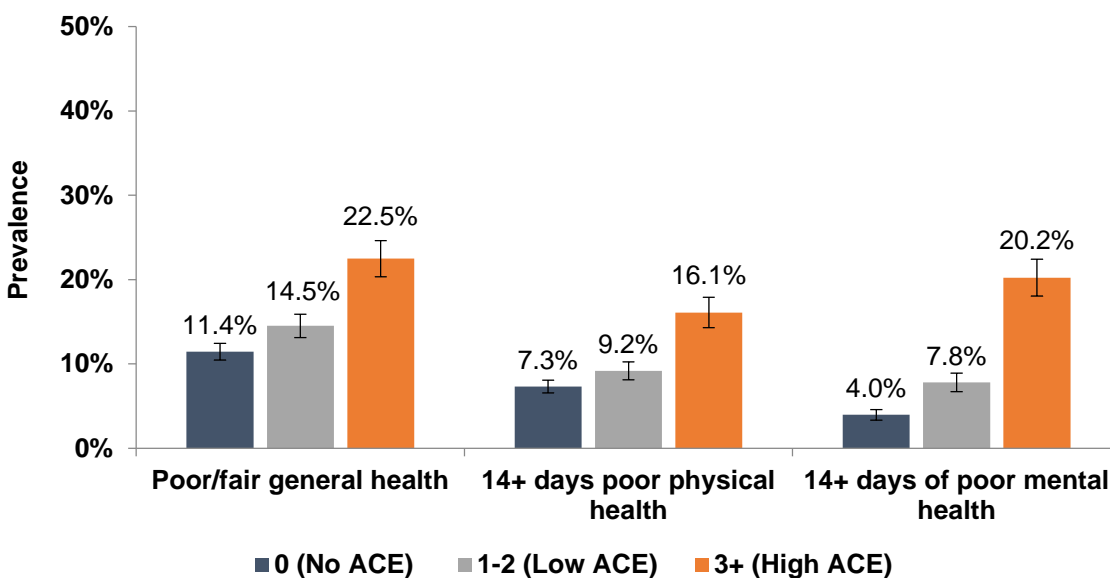
For more detailed information on the prevalence of health risk factors and selected chronic health conditions by ACE score category, see Appendix B.

Figure 6. Prevalence of selected health risk factors among Kansas adults aged 18 years and older by ACE score group, KS BRFSS 2014



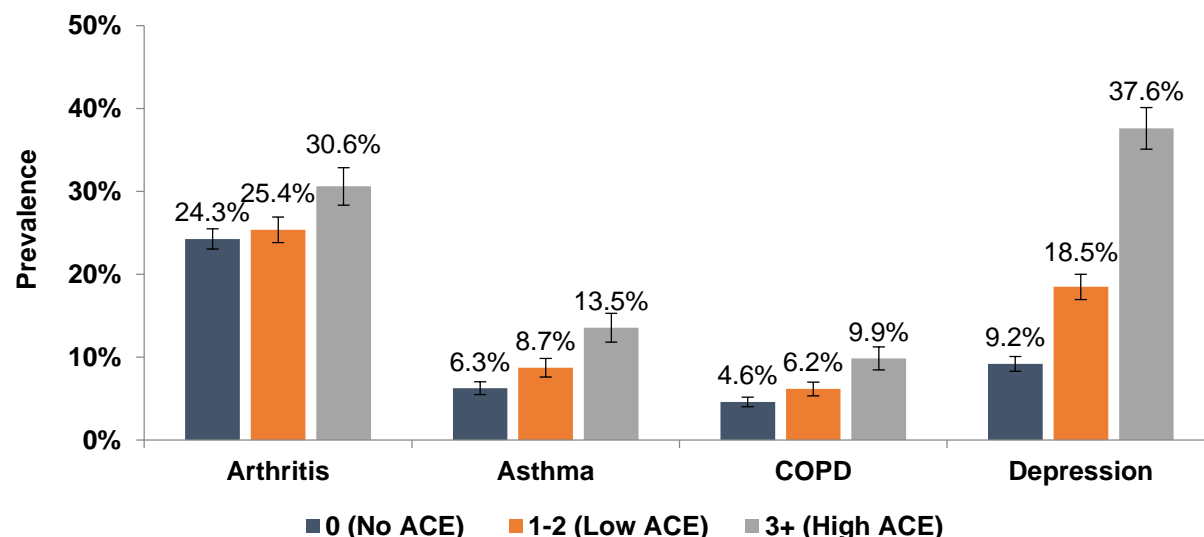
Source: 2014 Kansas Behavioral Risk Factor Surveillance System, Bureau of Health Promotion, KDHE.

Figure 7. Prevalence of perceived poor health indicators among Kansas adults aged 18 years and older by ACE score group, KS BRFSS 2014



Source: 2014 Kansas Behavioral Risk Factor Surveillance System, Bureau of Health Promotion, KDHE.

Figure 8. Prevalence of selected chronic conditions among Kansas adults aged 18 years and older by ACE Score Group, KS BRFSS 2014



Source: 2014 Kansas Behavioral Risk Factor Surveillance System, Bureau of Health Promotion, KDHE.

Statistical Associations Between Health Risk Factors and Health Conditions, and ACE Score

Logistic regression modeling is one analytic method that can be used to examine the association between two or more variables while statistically controlling for additional, potentially confounding variables. In this report, prevalence odds ratios were calculated using logistic regression models to compare the prevalence odds of selected health risk factors, perceived poor health indicators and chronic conditions between adults who reported having three or more ACE compared with adults who reported not having any ACE. Adjusted prevalence odds ratios (POR) and 95 percent confidence intervals were also calculated to examine these associations while controlling for age, gender, race/ethnicity, education and income. A prevalence odds ratio with a 95 percent confidence interval that contains 1 can be interpreted as no significant association between the selected health risk factor or health condition, and ACE score.

Compared with those who did not experience any ACE, Kansas adults with three or more ACE had significantly higher prevalence odds of the following health risk factors, perceived poor health indicators and chronic conditions, after controlling for selected demographic characteristics (Table 2):

- Current smoking,
- Binge drinking,
- Obesity,
- Poor/fair general health,
- 14 or more days of poor physical health,
- 14 or more days of poor mental health,
- Arthritis,
- Asthma,
- Cancer,
- Coronary Heart Disease,
- COPD,
- Depression,
- Diabetes,
- Heart attack,
- Kidney disease, and
- Stroke.

In other words, there was a statistically significant positive association between each of these health risk factors, perceived poor health indicators and chronic conditions, and ACE score.

Table 2. Crude and adjusted prevalence odds ratios of selected health risk factors and conditions among Kansas adults aged 18 years and older with high ACE scores (3+) compared with those with no ACE, KS BRFSS 2014

	Crude POR	95% CI	Adjusted POR*	95% CI
Health risk factors				
Current smoking	3.3	2.8 to 3.9	2.2	1.9 to 2.7
Binge drinking	1.5	1.2 to 1.8	1.3	1.1 to 1.6
Heavy drinking	1.4	1.1 to 1.9	1.4	1.1 to 2.0
Obesity	1.4	1.2 to 1.6	1.4	1.2 to 1.6
Perceived poor health				
Poor/fair general health	2.2	1.9 to 2.6	2.3	1.9 to 2.8
14+ days poor physical health	2.4	2.0 to 2.9	2.5	2.0 to 3.1
14+ days of poor mental health	6.1	5.0 to 7.6	4.7	3.7 to 5.9
Chronic conditions				
Arthritis	1.4	1.2 to 1.6	2.4	2.0 to 2.8
Asthma (current)	2.3	1.9 to 2.9	2.0	1.6 to 2.6
Cancer	0.8	0.7 to 1.0	1.4	1.1 to 1.8
Coronary Heart Disease	0.9	0.7 to 1.2	1.6	1.2 to 2.1
COPD	2.3	1.8 to 2.8	2.8	2.2 to 3.5
Depression	5.9	5.1 to 6.9	5.4	4.5 to 6.4
Diabetes	1.1	0.9 to 1.3	1.4	1.1 to 1.7
Heart attack	1.0	0.8 to 1.3	1.5	1.1 to 2.0
Kidney Disease	1.4	1.0 to 2.0	1.8	1.3 to 2.6
Stroke	1.4	1.1 to 1.9	1.8	1.3 to 2.6

*Model adjusts for age, gender, race/ethnicity, education and income.

Source: 2014 Kansas Behavioral Risk Factor Surveillance System, Bureau of Health Promotion, KDHE.

Conclusion

ACE are prevalent: slightly more than half of Kansas adults have experienced at least one ACE. In Kansas, high ACE scores (3+) are more common among younger adults, those with lower levels of education, those with lower annual household incomes, non-Hispanic other and multiracial adults, Hispanics and women. Kansas data mirror findings in other states^{vi,ix} and highlight the need to increase awareness of ACE as a public health issue. Preventing ACE may have beneficial effects on the long-term health of Kansans.

Appendix A. Prevalence of No (0), Low (1-2), and High (3+) ACE among Kansas adults aged 18 years and older by demographic characteristics, KS BRFSS 2014

		0 (No ACE)				1-2 (Low ACE)				3+ (High ACE)			
		N	Percent	95% CI		N	Percent	95% CI		N	Percent	95% CI	
Overall		5,564	45.5%	44.3%	to 46.6%	3,695	33.6%	32.5%	to 34.7%	2,094	21.0%	20.0%	to 21.9%
Gender													
	Women	3,153	43.8%	42.3%	to 45.3%	2,064	32.6%	31.1%	to 34.0%	1,299	23.6%	22.3%	to 25.0%
	Men	2,411	47.1%	45.4%	to 48.8%	1,631	34.6%	33.0%	to 36.3%	795	18.2%	16.9%	to 19.6%
Age Group													
	18-24 years	257	38.2%	34.1%	to 42.4%	254	37.9%	33.8%	to 42.1%	167	23.8%	20.4%	to 27.3%
	25-34 years	435	39.4%	36.2%	to 42.6%	378	33.6%	30.6%	to 36.7%	299	27.0%	24.1%	to 29.9%
	35-44 years	535	40.1%	37.1%	to 43.1%	439	33.4%	30.5%	to 36.3%	330	26.4%	23.6%	to 29.3%
	45-54 years	805	43.0%	40.4%	to 45.5%	619	34.2%	31.7%	to 36.7%	422	22.8%	20.7%	to 25.0%
	55-64 years	1,218	45.9%	43.7%	to 48.0%	887	34.2%	32.1%	to 36.3%	503	19.9%	18.2%	to 21.7%
	65+ years	2,282	61.0%	59.2%	to 62.8%	1,100	29.7%	28.0%	to 31.3%	366	9.3%	8.3%	to 10.4%
Race/Ethnicity													
	NH White	5,014	47.5%	46.3%	to 48.7%	3,143	32.8%	31.7%	to 34.0%	1,700	19.6%	18.6%	to 20.6%
	NH Black	124	28.6%	23.3%	to 34.0%	163	46.5%	40.4%	to 52.6%	87	24.9%	19.6%	to 30.2%
	NH Other/Multi	145	37.0%	31.1%	to 42.9%	138	32.3%	26.4%	to 38.3%	139	30.7%	25.4%	to 36.0%
	Hispanic	229	39.0%	34.4%	to 43.5%	220	34.5%	30.2%	to 38.8%	155	26.5%	22.4%	to 30.6%
Annual Household Income													
	Less than \$15,000	254	31.6%	27.5%	to 35.7%	267	33.3%	29.2%	to 37.4%	270	35.1%	30.9%	to 39.2%
	\$15,000 to \$24,999	668	37.4%	34.3%	to 40.4%	487	33.5%	30.5%	to 36.6%	368	29.1%	26.0%	to 32.2%
	\$25,000 to \$34,999	560	43.5%	40.1%	to 47.0%	386	35.0%	31.6%	to 38.3%	206	21.5%	18.5%	to 24.5%
	\$35,000 to \$49,999	818	49.5%	46.6%	to 52.5%	535	32.6%	29.8%	to 35.4%	257	17.8%	15.5%	to 20.1%
	\$50,000 or more	2,391	48.5%	46.8%	to 50.2%	1,550	33.8%	32.1%	to 35.5%	778	17.7%	16.4%	to 19.0%
Education Level													
	Less than H.S.	252	38.6%	34.0%	to 43.1%	186	31.4%	26.9%	to 35.9%	170	30.0%	25.6%	to 34.5%
	H.S. grad or G.E.D.	1,505	45.4%	43.3%	to 47.5%	1,019	33.6%	31.6%	to 35.7%	577	20.9%	19.1%	to 22.7%
	Some college	1,521	42.3%	40.3%	to 44.3%	1,110	34.8%	32.8%	to 36.8%	711	22.9%	21.2%	to 24.6%
	College Graduate	2,279	51.8%	50.1%	to 53.6%	1,376	32.8%	31.1%	to 34.5%	634	15.4%	14.1%	to 16.7%

Appendix B. Prevalence of selected health risk factors, perceived poor health and chronic conditions among Kansas adults aged 18 years and older by ACE score category, KS BRFSS 2014

	0 (No ACE)			1-2 (Low ACE)			3+ (High ACE)		
	N	Percent	95% CI	N	Percent	95% CI	N	Percent	95% CI
Health risk factors									
Current smoking	555	11.5%	10.4% to 12.6%	548	16.3%	14.8% to 17.8%	551	30.2%	27.7% to 32.7%
Binge drinking	538	13.8%	12.6% to 15.1%	468	16.9%	15.3% to 18.5%	309	19.1%	16.9% to 21.3%
Heavy drinking	212	4.5%	3.7% to 5.2%	184	5.3%	4.3% to 6.2%	122	6.2%	4.9% to 7.4%
Obesity	1,563	28.6%	27.2% to 30.1%	1,187	32.6%	30.7% to 34.4%	773	36.1%	33.6% to 38.6%
Perceived poor health									
Poor/fair general health	692	11.4%	10.5% to 12.4%	593	14.5%	13.1% to 15.9%	498	22.5%	20.4% to 24.6%
14+ days poor physical health	472	7.3%	6.6% to 8.1%	391	9.2%	8.1% to 10.2%	375	16.1%	14.3% to 17.9%
14+ days of poor mental health	230	4.0%	3.4% to 4.6%	281	7.8%	6.7% to 8.9%	388	20.2%	18.0% to 22.4%
Chronic conditions									
Arthritis	1,778	24.3%	23.0% to 25.5%	1,261	25.4%	23.8% to 26.9%	793	30.6%	28.3% to 32.9%
Asthma (current)	358	6.3%	5.5% to 7.0%	317	8.7%	7.6% to 9.8%	292	13.5%	11.8% to 15.3%
Cancer	576	7.5%	6.8% to 8.2%	352	6.6%	5.8% to 7.4%	185	6.4%	5.3% to 7.5%
Coronary Heart Disease	331	4.6%	4.0% to 5.2%	206	4.0%	3.4% to 4.7%	131	4.4%	3.5% to 5.2%
COPD	306	4.6%	4.0% to 5.2%	297	6.2%	5.3% to 7.0%	258	9.9%	8.5% to 11.3%
Depression	563	9.2%	8.3% to 10.1%	743	18.5%	16.9% to 20.0%	817	37.6%	35.1% to 40.1%
Diabetes	697	10.1%	9.3% to 10.9%	508	11.1%	10.0% to 12.3%	287	10.6%	9.2% to 12.1%
Heart attack	306	4.5%	3.9% to 5.0%	181	3.8%	3.2% to 4.5%	127	4.4%	3.5% to 5.2%
Kidney Disease	154	2.2%	1.8% to 2.6%	132	2.6%	2.1% to 3.1%	77	3.1%	2.3% to 3.9%
Stroke	185	2.7%	2.3% to 3.2%	150	3.3%	2.6% to 3.9%	118	3.8%	3.0% to 4.6%

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